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## TABLE OF CONTENTS

<b>1. EXECUTIVE SUMMARY .....</b>	<b>2</b>
1.1 METHODS .....	2
1.2 FINDINGS .....	3
1.2.1 Current Revenues .....	3
1.2.2 Current Costs.....	3
1.2.3 PSAP Needs.....	4
1.3 RECOMMENDATIONS.....	4
<b>2. INTRODUCTION .....</b>	<b>5</b>
<b>3. METHODS.....</b>	<b>6</b>
<b>4. FINDINGS.....</b>	<b>7</b>
4.1 CURRENT REVENUES AND COSTS .....	7
4.1.1 Current Revenues Based on the Auditor's Data.....	7
4.1.2 Current Revenues Based on County- or PSAP-Provided Information .....	8
4.2 PSAP NEEDS .....	9
4.2.1 Provision of 9-1-1 Services to Unserved Areas .....	9
4.2.2 PSAP 9-1-1 Connectivity and Services.....	10
4.2.3 Personnel Costs .....	10
4.2.4 Education.....	10
4.2.5 Call Accounting Software.....	10
4.2.6 Alternate Opportunities .....	11
4.2.7 Provision of 9-1-1 Services for Uncovered Counties.....	11
4.2.8 Creating a Partnership.....	11
4.2.9 Regional PSAPs.....	11
4.2.10 Upgrading to Enhanced 9-1-1 Service.....	12
4.2.11 Delivering Phase I and Phase II 9-1-1 Wireless Services.....	12
4.3 PSAP CONNECTIVITY TO A STATEWIDE IP-ENABLED NETWORK .....	13
4.4 PSAP ALI .....	14
<b>5. RECOMMENDATIONS.....</b>	<b>16</b>
<b>GLOSSARY .....</b>	<b>17</b>
<b>APPENDIX A .....</b>	<b>18</b>

## 1. EXECUTIVE SUMMARY

L. Robert Kimball & Associates, Inc. (Kimball) is pleased to provide the state of Missouri's Office of Administration with its *PSAP Needs Analysis* report. This is the third of four reports delivered as part of the statewide 9-1-1 assessment project.

The first report entitled "*Current PSAP and 9-1-1 Infrastructure*" reviewed and assessed what currently exists in Missouri. The second report entitled "*Recommendations for a Statewide IP-Enabled Network*" discussed options for implementing a new Internet Protocol (IP)-enabled infrastructure. This report builds on the information gathered for those two reports and identifies what would be needed at the primary Public Safety Answering Point (PSAP) level to interface from the existing 9-1-1 Customer Premises Equipment (CPE) to a new IP-enabled 9-1-1 infrastructure.

### 1.1 METHODS

For the purposes of this assessment project, Kimball assumed that a statewide system would be created as a result of the procurement under *RFP B2Z06066 - Next Generation Network*.

The task of identifying what would be required at the primary PSAP level to interface its existing CPE was accomplished as we analyzed the data gathered and compiled for the reports entitled "*Current PSAP and 9-1-1 Infrastructure*" and "*Recommendations for a Statewide IP-Enabled Network*".

As with the prior reports, please bear in mind that our estimates are just that. We were not able to obtain all the necessary information for every County or every PSAP. We were able to obtain enough information to perform the assessment, using our industry knowledge and our expertise to guide us where Missouri-specific information was not available or not reliable.

Based on Kimball's experience and general cost estimates we have been provided in similar network solutions, we established a cost per circuit for each connection between the PSAP and the county seat Point of Presence (POP) (See Appendix A). The cost estimate is \$1,500 per month with a \$750 one-time connection charge. These are estimated costs, and the actual costs should be negotiated with the provider selected. These prices may be able to be reduced in a large group purchase, and the one-time charges reduced or even eliminated in some cases.

## **1.2 FINDINGS**

### **1.2.1 Current Revenues**

There are three mechanisms for funding 9-1-1 services in the State of Missouri:

- **Basic Rate Tariff** – Basic Rate Tariff means the base price of monthly telephone service. A percentage of that base rate is set aside for 9-1-1. The surcharge is collected by the Local Exchange Carrier (LEC) and returned directly to the PSAP. LECs in Missouri no longer file a Basic Rate Tariff, but this method of funding 9-1-1 continues based on the base price for telephone service;
- **Sales Tax** – This is a sales tax levied by the municipality or County, collected by the State and returned to the appropriate municipality or County to fund 9-1-1 services.
- **General Revenue** – In this case, 9-1-1 is funded from general revenues and is part of a budget. It may or may not have its own line item and may in fact be part of several budgets of a given agency.

The aggregate statewide revenue for 9-1-1 is approximately \$34,143,992. This number is for the 87 Counties for which we have financial information.

The existing funding mechanisms have not been adequate to enable some of the most rural areas to afford to implement 9-1-1. In addition, the amounts collected for the same service are not equal. Finally, a number of counties for which we have information have at least occasionally experienced a deficit between 9-1-1 revenues and costs.

### **1.2.2 Current Costs**

Information given to us by the PSAPs was not consistent, and we found that they did not call the same expenses by the same names. Thus, we determined that the information was not of particular benefit to the statewide assessment project.

Information from the Auditor's website was also problematic, but at least the numbers had been verified. The problems included the datedness of some of the information and the fact that the Auditor did not specify what the money had been spent on or what the revenue source was. So, Kimball could not determine whether the expenditures were solely for the items under consideration for this study, or for unrelated items.

The Auditor's information revealed that a number of counties have experienced a deficit between 9-1-1 revenues and costs. However, since the Auditor's data did not identify what the money had been spent on, we cannot say with certainty that the deficit occurred because costs solely attributable to 9-1-1 exceeded revenues, or because the PSAP used its revenues to pay for other costs that were not solely attributable to 9-1-1.

### **1.2.3 PSAP Needs**

One of the clear needs is the requirement to provide 9-1-1 service. The current models allow the local government to choose if they wish to provide this service. The funding mechanism allows the local government to collect funds to provide this service, but does not establish minimum service levels.

## **1.3 RECOMMENDATIONS**

Kimball recommends that the State mandate enhanced 9-1-1 (E9-1-1) service, and establish minimum standards for service level.

Kimball recommends that the State adopt rules governing authorized uses of 9-1-1 funds.

Currently some of the PSAPs are installing or have just installed CPE that has no migration path to allow it to accept the new 9-1-1 services such as data and video. Kimball recommends that the State require that all purchases of PSAP CPE be based on the NENA IP PSAP standard.

Kimball recommends that the state of Missouri establish a mechanism to assist the PSAPs/systems to upgrade their CPE.

We recommend that PSAPs, particularly in low call volume situations, share backroom CPE in a virtual PSAP configuration. This could be very effective in reducing the costs for smaller population counties to establish or support 9-1-1 services. It should be required for those counties with multiple PSAPs. It is noted that there are counties and regions in the State that are good examples of what can be accomplished by following this recommendation.

We recommend that all new PSAPs and all PSAPs upgrading their equipment be required to include mapping sufficient to accept and locate wireless Phase II 9-1-1 calls.

Finally, Kimball recommends that the State establish a dedicated, statewide funding mechanism. Such a mechanism, in combination with the previous recommendations, would help improve 9-1-1 services throughout the state of Missouri. Our recommendations for a new funding mechanism are contained in the report entitled "*Costs and Revenues Associated with a Statewide IP-enabled Network*".

## **2. INTRODUCTION**

As outlined previously, the joint State-Kimball project team proceeded on the understanding that we would be able to collect the revenue and cost information from the LECs. It was recognized that in those cases where funding was provided from General Revenue that it was likely that no data would be available.

Not all of the LECs responded completely to our requests for specific revenue and costs. As a result, we collected all of the information possible from the Missouri State Auditors website and by calling the PSAPs. Though this strategy eventually led to the collection of a significant amount of revenue data, it occurred very late in the project timeline.

### 3. METHODS

Kimball's methods assumed that a statewide system would be created as a result of the procurement under *RFP B2Z06066 - Next Generation Network*.

We used the data gathered and compiled for the reports entitled "*Current PSAP and 9-1-1 Infrastructure*" and "*Recommendations for a Statewide IP-Enabled Network*". Further analysis of that information resulted in identifying what would be required at the primary PSAP level to interface its existing CPE to the State's IP backbone.

As with the prior reports, what we have provided are estimates. We were not able to obtain all the necessary information for every County or every PSAP. We were able to obtain enough information to perform the assessment, using our industry knowledge and our expertise to guide us where Missouri-specific information was not available or not reliable.

We established a cost per circuit for each connection based on the experience and general cost estimates we have identified in similar network solutions. The circuit we envision is a full T-1. The estimated costs are provided below, and the actual costs would be negotiated with the provider selected.

## **4. FINDINGS**

By the means identified in the Methods section of this report, Kimball collected financial data for 87 of Missouri's 115 counties. Five counties fund 9-1-1 using General Revenues, including the City of St. Louis fund through General Revenues, so no information was available for these locations. We were not able to get any information for the County of Jasper. The remaining 21 counties do not have 9-1-1 service at the present time.

Kimball reviewed the audits listed on the Auditor's website and obtained 9-1-1 revenue and cost information for 65 counties. The information collected dated from as far back as 1999 to as recent as 2005.

The Auditor's information did not indicate the specific source(s) of the revenue listed for the 9-1-1 accounts.

When we compared the revenues reported by the PSAPs and revenues from the Auditor's web site, the PSAP-provided amount was lower.

In the case of expenditures, 9-1-1 equipment and service costs is only a portion of the total costs associated with operating a PSAP or communications center. PSAPs experience additional costs associated with facilities, non-9-1-1 communications equipment, personnel, etc. We were not able to determine how much of the reported expenditures from the 9-1-1 line items audited went for 9-1-1 equipment and services needed to operate the PSAP and how much went for other PSAP needs.

Cost information provided by the PSAPs was insufficient to enable us to provide the State with a total cost of PSAP operations, as they exist today. We were, however, able to use some of this information to give examples of Missouri's PSAPs' costs.

### **4.1 CURRENT REVENUES AND COSTS**

The term "System" is applied to a group of PSAPs or jurisdictions that have pooled resources and shared equipment. In Missouri this has been done with several PSAPs sharing the costs of CPE or having an oversight board to negotiate bulk pricing for equipment. There is even an example of two counties sharing one PSAP.

#### **4.1.1 Current Revenues Based on the Auditor's Data**

- Auditor's data was collected from 65 counties with total of 78 PSAPs.
- Total Revenue: \$19,952,810
- Total Expense: \$18,172,974
- Average Revenue per PSAP: \$255,805.26

- Average Expense per PSAP: \$232,986.85
- Average Difference in Cash Flow: +\$22,818.41
- Single Largest Positive Cash Flow by County: \$291,994
- Single Largest Yearly Deficit per County: \$270,312
- Twenty-five Counties Operating with Average Total Deficit of \$1,251,217
- Average Yearly Deficit Spending per County: \$50,048.68
- Of the counties operating in a deficit, 16 had one PSAP and seven had two PSAPs

#### **4.1.2 Current Revenues Based on County- or PSAP-Provided Information**

The data collected from the PSAPs lent itself more to the determination of revenue than the determination of costs. This data, unlike that collected from the Auditor, was from the years 2005 and 2006 to date. Due to the variations of the PSAP data, no comparison of costs could be provided. However, we did use that information to provide the PSAP cost example that follows.

- PSAP data was used from 23 counties with 82 PSAPs
- Total Revenue: \$14,191,181.95
- Average Revenue per PSAP: \$173,063.19

Two city PSAPs collecting their own revenue, PSAPs funded by General Revenue, and four PSAPs for which data was not received are not included in these totals.

#### **PSAP Cost Examples**

<b>Type of System</b>	<b>Number of PSAPs</b>	<b>Yearly Revenue</b>	<b>Yearly Cost</b>
County	23	\$566,839.55	\$1,234,396.32
County	6	\$499,721.16	\$ 583,357.80
County	3	\$519,605.00	\$ 218,844.24
County	1	\$239,231.00	\$ 137,575.92
County	1	\$277,755.03	\$ 63,627.72

*Note: Cost data supplied by LEC in some cases*

Once again, it is important to remember that the costs above do not include any expenses other than 9-1-1 services and in some cases equipment leases.

## 4.2 PSAP NEEDS

### 4.2.1 Provision of 9-1-1 Services to Unserved Areas

Twenty-one counties in the State do not have 9-1-1 service. If each of these counties were to implement its own 9-1-1 service, it would need 9-1-1 equipment, personnel, and services in addition to other non-9-1-1 specific facilities, services, and equipment needed to operate a fully functional PSAP.

#### 4.2.1.1 9-1-1 CPE

As part of this project, Kimball researched the budgetary costs that one might expect to incur for 9-1-1 CPE that would meet today's requirements and be able to migrate to meet future technologies. The table below provides some budgetary 9-1-1 CPE prices.

Number of 9-1-1 Positions	Cost
Two	\$121,000
Four	\$148,000
Six	\$205,000
Ten	\$315,033

The table below shows the difference between the cost of each of the counties implementing 9-1-1 service by purchasing its own CPE and by sharing facilities and equipment or by sharing the backroom CPE in a virtual PSAP configuration.

Number of Individual Counties	Number of Positions Each	Cost	Number of Counties Sharing Equipment	Number of Positions	Cost
One	Two	\$121,000	One	Two	\$121,000
Two	Two	\$242,000	Two	Four	\$148,00
Six	Two	\$726,000	Six	Ten	\$309,240

*Note: If the counties decided to share the system in a virtual PSAP manner, there would be some additional cost for connectivity and remote connection.*

The same scenario would apply if PSAPs now operating in a stand-alone manner decided to work together either in the same facility or in a virtual PSAP configuration.

#### **4.2.2 PSAP 9-1-1 Connectivity and Services**

While it is not possible to determine an actual cost for the LEC provided connectivity and services required to implement new PSAPs. We know from the table of PSAP Cost Examples above that connectivity and services for two PSAP, one having two positions and one having ten positions, range between \$63,627.72 and \$137,575.92. These are the costs reported as being paid to the LEC to provide 9-1-1 service.

#### **4.2.3 Personnel Costs**

It is generally accepted that five telecommunicators are required to staff one position twenty-four hours a day seven days a week. Using the lower hourly wages found on the National Emergency Number Association (NENA) classified webpage of \$11.80 per hour, we estimated that it would cost about \$23,010 plus benefits per telecommunicator to staff a PSAP. The total cost at the wages for five telecommunicators would be \$115,050. If benefits were 30%, as they are in some localities, they would total \$34,515. The total cost is estimated at \$149,565.

The nationally recognized standard for staffing is for PSAPs to have two people on duty at all times.

#### **4.2.4 Education**

Another recommendation has to do with education of some of the PSAP personnel, particularly as it relates to wireless 9-1-1. This education could be supplied in many ways, each having its own cost. It could be done as simply as using knowledgeable people from PSAPs within the State or region to train personnel from other PSAPs. It could be accomplished by using organizations such as Missouri NENA Chapter (MONENA) to provide the training. Agencies could send personnel to the break out training courses offered by the national professional organizations such as NENA or Association of Public-Safety Communications Officials International, Inc. (APCO). The cost to provide training would be dependent upon the manner chosen to provide it.

#### **4.2.5 Call Accounting Software**

During the collection of information from the PSAPs in the State, it became apparent that most of the PSAPs either did not have call accounting software or were not familiar with how to use it. The lack of wireless call volumes from even some of the larger 9-1-1 PSAPs or systems attests to the need to be able to measure and account for a PSAP's workload.

Detailed costs to add call accounting software to the in-place CPE cannot be identified without a detailed investigation because the software may be available from the serving LEC as a service, or it may need to be purchased and installed by the current CPE vendor. The CPE prices quoted earlier in this report include the necessary call accounting software. We have seen some statistics packages for CPE that would provide the level of service needed for approximately \$4,000 per PSAP or system.

#### **4.2.6 Alternate Opportunities**

In the event that the State does not choose to implement an IP network or to move forward with one or more of the recommendations made by Kimball, there are alternatives or opportunities that could be used to implement 9-1-1 service where it does not currently exist or to upgrade the existing level of service and equipment.

#### **4.2.7 Provision of 9-1-1 Services for Uncovered Counties**

The following alternatives identify several ways of implementing 9-1-1 services to the unserved counties.

##### *4.2.7.1 Contracting with Existing PSAPs/Systems*

The cost of this alternative is based on an agreed upon amount between the County needing to acquire 9-1-1 service and the existing PSAP/system in an adjoining County. The service can be as simple as paying the providing PSAP to answer and dispatch 9-1-1 calls, or it can include sharing access to backroom 9-1-1 equipment that is in place in the existing PSAP. In either case, it will require connectivity and database services needed to connect the subscribers in the unserved County to the 9-1-1 system.

Our experience has revealed contract prices based on a cost per call that are as low as of \$6.25 to contract pricing in the thousands of dollars. As an example, if a PSAP with 3,000 calls annually could contract with an existing PSAP at a rate of \$6.25 per call, the total cost for receiving and dispatching the calls would be \$18,750 annually. If, for example, the cost of connectivity and services from the table above (\$63,627.72) is added, the total cost for services is approximately \$82,377.72 per year. This is an example cost estimate, and a more detailed analysis would be necessary to determine the actual cost.

If the choice were to add a 9-1-1 workstation for the unserved County's use then a minimum of \$14,231 plus connectivity would need to be added to the cost.

##### *4.2.7.2 Creating a Partnership*

Creating a partnership is very similar to that of contracting. The costs would be based on the same functionality and service needs, but in this case the new user would become a part owner of the PSAP as far as services and maybe equipment were concerned. The new user would accept a portion of all of the expenses; therefore, this arrangement would be more costly in most cases than the contract scenario. Without specifics, it would not be possible to estimate such an arrangement.

##### *4.2.7.3 Regional PSAPs*

Regional PSAPs currently exist in the state of Missouri; one of these PSAPs has three positions and serves two counties. Its expenses, based on the Missouri State Auditors information, are in

the \$400,000 range per year. Another regional PSAP serves four counties and has expenses in the \$700,000 dollar range, again according to the Auditor's information.

#### *4.2.7.4 Upgrading to Enhanced 9-1-1 Service*

The cost to upgrade from Basic 9-1-1 to Enhanced 9-1-1 would be approximately the same as creating a new PSAP; however, existing personnel might be able to be used, avoiding the additional personnel cost.

#### *4.2.7.5 Delivering Phase I and Phase II 9-1-1 Wireless Services*

Though the FCC order that requires wireless carriers to provide Phase I and Phase II 9-1-1 service does not require that the PSAP use a Geographic Information Services (GIS) map, it does require that the PSAP be able to use the data received with the calls, including the location data.

The implementation of a computerized mapping system can be accomplished using off-the-shelf, stand-alone software for very little. However, this software is not usually up to date with the latest street information and not as accurate as GIS mapping designed for the geographical area that is to be served. It is usually updated only when a new copy is purchased. In addition, this type of implementation causes more work for the telecommunicator and requires more time to process calls.

The cost to develop accurate address/coordinate-based mapping for a 9-1-1 system or PSAP is based on many variables such as size of the County, number of streets and highways, time involved in the project as well as the software for use by the telecommunicator.

One estimate to provide the services necessary to create a map for an average-size County with a population of 20,000 to 30,000, a land area of 800 to 900 square miles containing 900 to 1,200 linear road miles and 20 to 25 cell sectors, puts the cost at approximately \$35,000 to \$41,250 plus the cost of the 9-1-1 position software about \$10,000 per position and the needed computer equipment which can be purchased on some State bids for less than a \$1,000. Using two positions at the higher cost, the total would be about \$53,250.

Because of the way 9-1-1 is priced by some LECs providing service in Missouri, their charges to upgrade to wireless 9-1-1 are not included in the estimate.

#### *4.2.7.6 Upgrade of 9-1-1 Equipment*

Most of the PSAPs in the State will need to upgrade their equipment to be able to accept the new services, such as text messaging and video. The cost of these upgrades can be estimated on an individual or group PSAP basis using the equipment cost tables in the 9-1-1 CPE portion of this report. As an example, if 136 of the 9-1-1 systems/PSAPs in State each had two positions and upgraded their equipment to that compliant with the NENA IP standard, the cost would be approximately \$16,456,000. In fact, the cost will be much more because some PSAPs have more than two positions and some have existing connectivity to Private Branch eXchange (PBX) systems that will add to the cost.

To obtain specific revenue and cost figures associated with the operation of PSAPs in the state of Missouri, it would require a complete audit of each County and PSAP. This level of data collection was not within the scope of this project.

#### **4.3 PSAP CONNECTIVITY TO A STATEWIDE IP-ENABLED NETWORK**

We used common networking practices found in the telecommunications field, as well as documents and statements from national organizations such as NENA, APCO and U.S. Department of Transportation (USDOT) to make certain Kimball recommendations conform to industry standards. The Kimball team also applied its internal knowledge and expertise gained as a result of working on similar projects for other states. Most importantly, however, was the task of ensuring that our analysis was done in the context of the Missouri state 9-1-1 coordinator's vision for the future.

For the purpose of this report, Kimball assumed that Missouri's IP network, which is now in the Request for Proposal (RFP) process, would be built.

The costs included in this report are contingent on the choice of the final network type. Various network types require different equipment and connectivity methods and affect these costs. In addition, the design of these networks can also affect equipment elements and connectivity segments. This will also change the amount and type of equipment and connectivity needed, thus changing the costs.

For the purpose of this report, the County seat POP will be the demarcation point between the network costs from the LEC selective routing elements to the POP and detailed in another report. The PSAP costs in this report include transport between the County seat POP and the PSAP.

As the IP E9-1-1 network will need to be appropriately configured and sized based on actual bandwidth requirements, this report makes certain assumptions regarding network sizing. Kimball recommends that the IP E9-1-1 network be built on a "ring" topology, thereby providing diverse and redundant links to the IP E9-1-1 network for each PSAP. The number of PSAPs associated with one ring network is based on the total bandwidth requirements of the PSAPs in the ring.

Several elements are involved in producing an accurate bandwidth calculation at the PSAP level. Some of these elements are the existing trunks, ALI data delivery, and future technologies expected. In addition, the type of network being implemented, for example such as MPLS or ATM, with different designs, will affect the network and also the bandwidth allocation to the PSAP. Another element that can affect the bandwidth requirement at the PSAP is the new CPE type. For example, some CPE is installed in a host environment where several redundant servers deliver 9-1-1 voice and data to the individual PSAP workstation.

Kimball recommends 9-1-1 networks be redundant with full survivability. With that said, a ring environment may be suggested in a respondents' solution to an RFP.

Taking an example from one of the ring options outlined in the previous section, we envision one ring beginning at a County Seat, continuing to as few as two PSAPs and as many as eight or ten PSAPs, and terminating back to another County Seat. Typically, we recommend a minimum bandwidth of 1.544 Mbps (equal to a full T-1 or DS-1) for each ring. The number of PSAPs that could be on a ring would be determined by the elements mentioned above.

Today the PSAPs only receive voice, Automatic Number Identification (ANI) and ALI information. This multiple PSAP ring configuration would require a minimum of 1.544 Mbps of bandwidth on average to meet current 9-1-1 voice and data needs.

Kimball used the basic configuration of a ring connecting five PSAPs and two County seat POPs. Using this model, an estimated cost for each ring can be developed and networking costs for all PSAPs in the state can be estimated.

If the network topology to the PSAPs is a ring configuration as described in the above section, Kimball estimates the one-time equipment costs would be approximately \$3,657,500.

Additionally, Kimball estimates annual recurring costs for PSAP network connectivity, usage, and maintenance for routers and gateways is roughly \$3,780,000.

Kimball has included the costs associated with a “hub and spoke” IP E9-1-1 network topology as an alternative to the “ring” IP E9-1-1 network. A hub and spoke network provides the PSAP with two redundant connections to the local County seat POP. However, The hub and spoke approach does not provide diverse routing; simply redundant routes. Diversity could be added by using two different County seats for these connections, but no costs were developed for this.

If the hub and spoke configuration were to use two circuits from the County Seat to each PSAP, Kimball estimates the one-time equipment costs will be approximately \$5,762,000. Additionally, Kimball estimates annual recurring costs for PSAP network connectivity, usage, and maintenance for routers and gateways would be roughly \$6,192,000.

#### **4.4 PSAP ALI**

The 9-1-1 caller’s location information is a critical component of the Missouri E9-1-1 system. Today, the 9-1-1 caller’s location information is usually delivered to the PSAP via an analog network from a remotely located Automatic Location Identification (ALI) database. This analog data network is separate and distinct from the network that delivers the 9-1-1 caller’s voice and therefore represents an additional cost to the PSAP. The LEC or vendors specializing in E9-1-1 location databases historically provide these databases. Recently, however, numerous state and County PSAP agencies have opted to maintain their own ALI databases, thereby mitigating costs and realizing more control functions relative to error reporting and ready access to ALI data.

Each PSAP must have connectivity to ALI databases, (wireline, wireless and VoIP) in order to acquire the 9-1-1 caller’s location information. As stated above, the demarcation point for the PSAP ALI network costs was assumed to be located in the County seat.

PSAPs with a stand-alone ALI database are not addressed in this report. This is a local issue as the databases are under the control of the PSAP.

If the network connections and equipment are properly sized, there should be no additional network charges to use the ALI at the PSAP. The one area to look at carefully is the capabilities of the PSAP CPE when it is installed.

The CPE must be able to use the IP format being sent to it. This is usually done in coordination with the LEC to choose a format that will work with the CPE and that the LEC ALI database is capable of sending. Given the incomplete information provided by the LECs, we cannot recommend a solution at this time.

## **5. RECOMMENDATIONS**

Kimball recommends that the State mandate enhanced 9-1-1 service and establish minimum standards for service level. We provided some examples in Appendix H of the report entitled “*Current Public Safety Answering Point and 9-1-1 Infrastructure*”.

Kimball also recommends that the State adopt rules governing authorized uses of 9-1-1 funds.

Currently some of the PSAPs are installing or have just installed CPE that has no migration path to allow it to accept the new 9-1-1 services such as data and video. Kimball recommends that all purchases of PSAP CPE be based on the NENA IP PSAP standard. This should take effect immediately.

Kimball recommends that the state of Missouri establish a mechanism to assist the PSAPs/systems to upgrade their CPE.

As mentioned earlier, we recommend that PSAPs, particularly in low call volume situations, share backroom CPE in a virtual PSAP configuration. This could be very effective in reducing the costs for smaller population counties to establish or support 9-1-1 services. It should be required for those counties with multiple PSAPs. It is noted that there are counties and regions in the State that are good examples of what can be accomplished by following this recommendation.

We strongly recommend that all new PSAPs and all PSAPs upgrading their equipment be required to include mapping sufficient to accept and locate wireless Phase II 9-1-1 calls.

Finally, Kimball urges the State to establish a dedicated, statewide funding mechanism to help improve 9-1-1 services throughout the state of Missouri. Our recommendations for a new funding mechanism are contained in the report entitled “*Costs and Revenues Associated with a Statewide IP-enabled Network*”.

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## **GLOSSARY**

ALI	Automatic Location Information
ANI	Automatic Number Identification
CPE	Customer Premises Equipment
E9-1-1	Enhanced 9-1-1
GIS	Geographic Information Services
IP	Internet Protocol
LEC	Local Exchange Carrier
MONENA	Missouri NENA Chapter
NENA	National Emergency Number Association
PBX	Private Branch Exchange
POP	Point of Presence
PSAP	Public Safety Answering Point
RFP	Request for Proposal
USDOT	U.S. Department of Transportation
VoIP	Voice over Internet Protocol

## **APPENDIX A**

Map of the County Seats

# State of Missouri

## County Seats

